

Monday, July 23, 2007

## **NTSB Determines Cause Of Big Dig Tunnel Accident**



In a Board Meeting on July 10, 2007, the NTSB determined that the probable cause of the ceiling collapse in the D Street Portal of Interstate 90 connector tunnel in Boston, Massachusetts, was inappropriate use of an epoxy anchor adhesive. Over time, the epoxy deformed and fractured until several ceiling support anchors pulled free and allowed a portion of the ceiling to collapse.

Epoxy is a polymer and its stiffness is time and temperature dependent. If a load is applied suddenly, the epoxy responds like a hard solid. But if the load is then held constant, the molecules within the polymer may begin to rearrange and slide past one another, causing the epoxy to gradually deform in a process called creep. The epoxy used in the tunnel had poor creep resistance.

"This has been a multi-faceted and complicated investigation for the Safety Board. We expended many of our resources to find out what happened and to prevent similar accidents," said NTSB Chairman Mark V. Rosenker. "It is very clear that had this accident occurred at a different time of day it would have been more catastrophic, although one fatality is one too many."

On July 10, 2006, a passenger car was traveling eastbound in the D Street Portal when a section of the tunnel's suspended concrete ceiling became detached from the tunnel roof and fell onto the vehicle. Concrete panels from the ceiling crushed the right side of the vehicle roof as the car came to rest against the north wall of the tunnel. The passenger was fatally injured and the driver had minor injuries. A total of about 26 tons of concrete and associated suspension hardware fell onto the vehicle and the roadway.

The Board states in its probable cause that the use of an inappropriate epoxy formulation resulted from the failure of Gannett Fleming, Inc., (Gannett Fleming) and Bechtel/Parsons Brinckerhoff (B/BP) to identify potential creep in the anchor adhesive as a critical long-term failure mode and to account for possible anchor creep in the design, specifications, and approval process for the epoxy anchors used in the tunnel. The Board also notes that had Gannett Fleming specified the use of adhesive anchors with adequate creep resistance in the construction contract, a different anchor adhesive could have been chosen, and the accident might have been prevented.

## **NTSB Sends Team To Investigate Aviation Accident In Florida**

The NTSB sent a team of investigators to Sanford, Florida to investigate an accident in which an aircraft crashed into a residential area killing the two occupants of the airplane, along with three victims on the ground.

About 8:35 am on July 10, the pilot of the Cessna 310, which was en route from Daytona to Lakeland, Florida, reported smoke in the cockpit, declared an emergency, and was attempting to land at Orlando Sanford International Airport when the airplane crashed into houses. Three homes were damaged in the immediate area impacted by the aircraft.

NTSB investigator Brian Rayner was designated Investigator-in-Charge of the 8-member team. NTSB Vice Chairman Robert Sumwalt accompanied the team and served as principal spokesperson for the on-scene investigation. Additional team members included Mike Huhn (Ashburn air safety investigator); Joseph Panagiotou (RE-1 fire expert); Peter Knudson (Public Affairs); Ted Lopatkiewicz (Public Affairs); Eric Grosf (TDA); and Heather Eilser-Bower (VC Special Assistant). Parties to the investigation included the FAA, Cessna Aircraft Company, NASCAR, and Continental Motors.



**Members of the investigation team inspect the damage to nearby property**

## **NTSB Assisting In Brazilian Investigation Into Crash Of An Airbus 320**

The National Transportation Safety Board is assisting the government of Brazil in its investigation of the July 17 crash of an A-320 in Sao Paulo, Brazil.

The accident occurred when a TAM Airlines Airbus A-320, (Brazil registration PR-MBK), en route from Porto Alegre to Sao Paulo, while landing at Congonhas Airport, departed airport boundaries and struck a building. Fire ensued on impact. It is reported that almost 200 people were killed in the accident.

NTSB Chairman Mark V. Rosenker has designated senior investigator William English as the U.S. Accredited Representative.

The airline's flight recorders were brought to the NTSB laboratories in Washington by Brazilian investigators late last week.

## ***NTSB Testifies On Capitol Hill***

Member Hersman testified about motor carrier safety before the U.S. House of Representatives Subcommittee on Highways and Transit on July 11. The Subcommittee, chaired by Congressman Pete DeFazio, conducted the hearing on the FMCSA's oversight of high-risk motor carriers. Member Hersman's testimony discussed the compliance review process for motor carriers, medical oversight of commercial drivers, and on-board electronic data recorders. Dwight Foster (HS-1) helped prepare Member Hersman's testimony.

## ***Chairman Rosenker Visits Airbus and AAIB***

Chairman Mark Rosenker spent last week meeting with the UK Air Accidents Investigation Branch (AAIB) at their Farnborough headquarters, and also visited Airbus Headquarters. The Chairman, who was accompanied by Tom Doyle, spent the first part of the trip in London, England, where he met with senior representatives of the AAIB to discuss the importance of transportation safety, especially in regards to aviation. While in London, Chairman Rosenker met with Ambassador Robert Tuttle at the US Embassy in London. Later in the week, they met with senior officials at Airbus. While in Toulouse, the Chairman received a tour of the A380 production facilities, and was briefed on various safety technologies that Airbus is developing. They also learned about the continuing safety improvements that Airbus has been working on as a result of the American Airlines 587 accident. The Chairman and Mr. Doyle also met with Deputy Chief of Mission, Mr. Mark Pekala, at the US Embassy in Paris.



***Chairman Rosenker and Airbus Vice President of Safety, John Lauber***

## ***Member Hersman Addresses NHTSA School Bus Safety Summit***

Member Hersman spoke at the opening session of NHTSA's School Bus Safety Summit held in Washington, DC on July 11. This day-long public meeting brought together all of the key groups involved in school transportation to discuss the safety benefits, economic factors and other issues related to requiring seat belts on large school buses. Member Hersman's presentation provided information about school bus accidents the Safety Board has investigated and the recommendation to NHTSA to devise standards for school bus passenger safety, now on the Board's Most Wanted List. Dwight Foster (HS-1) and Julie Perrot (SR-10) assisted Member Hersman in preparing her presentation.

## ***NTSB Applauds US Senate For Passing Resolution***

Chairman Mark V. Rosenker praised the U.S. Senate for its passage of a resolution designating July 2007 as "National Teen Safe Driver Month."

The newly signed legislation, which is being observed by federal, state and local governments, encourages the development of resources to provide affordable, accessible and effective driver training for every teenage driver of the United States.

"By the Senate designating this month to teen driver safety, it highlights the importance the nation places on reducing the number of teen highway fatalities and injuries," Rosenker said. "The Safety Board believes accidents involving youths can be reduced by states implementing a graduated drivers license program for young drivers and preventing teens from using wireless communications devices while driving."

Motor vehicle crashes remain the leading cause of death for 15- through 20-year-olds. In 2004, teen drivers constituted only 6.3 percent of licensed drivers, but were involved in 13.6 percent of all highway fatal crashes and 18 percent of all police-reported crashes.

Some of the recommendations made by the Safety Board regarding youth drivers include:

Enact laws to provide for a three-stage graduated licensing (GDL) system for young novice drivers, and restrict young novice drivers with provisional or intermediate licenses (second stage), unless accompanied by a supervising adult driver who is at least 21 years old, from carrying more than one passenger under the age of 20 until they receive an unrestricted license or for at least 6 months (whichever is longer). Every state has enacted some form of GDL legislation.

Enact legislation to prohibit holders of learner's permits and intermediate licenses from using interactive wireless communication devices while driving. Chairman Rosenker noted that Virginia enacted a new law on July 1, 2007 that prohibits teen drivers from using interactive wireless devices except in an emergency. Currently, 18 states have some form of restriction on youth drivers using wireless devices.

## ***Upcoming Board Meeting***

The NTSB will meet to discuss the August 2006 accident of Comair Flight # 5191 on July 26 at 9:30 a.m. in the Board Room. On August 27, 2006, about 6:07 a.m., Comair flight 5191, a Bombardier CRJ-100, (N431CA) crashed upon takeoff from Blue Grass Airport in Lexington, Kentucky. Of the 47 passengers and 3 crewmembers onboard, 49 were fatally injured and one (the first officer) survived.

A live and archived webcast of the proceedings will be available on the Board's website at [www.nts.gov](http://www.nts.gov).

A summary of the final report, which will include findings, probable cause and safety recommendations, will appear on the web site shortly after the conclusion of the meeting. The entire report will appear on the web site several weeks later.